



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, MD 20910

AUG 03 2016

Pernille Hermansen
Bay State Wind Consent Project Manager
Bay State Wind LLC
One International Place
100 Oliver Street
Boston, MA 02110

Dear Ms. Hermansen,

Enclosed is an Incidental Harassment Authorization (IHA) issued pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*), to take small numbers of marine mammals, by Level B harassment, incidental to high-resolution geophysical and geotechnical survey investigations associated with marine site characterization activities off the coast of Massachusetts. You are required to comply with the conditions contained in the IHA, including all mitigation, monitoring, and reporting requirements. In addition, you must cooperate with any federal, state, or local agency monitoring the impacts of your activities.

If you have any questions concerning the IHA or its requirements, please contact John Fiorentino, Office of Protected Resources (NMFS), at 301-427-8477.

Sincerely,

Donna S. Wieting
Director, Office of Protected Resources

Enclosure



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INCIDENTAL HARASSMENT AUTHORIZATION

Bay State Wind LLC (Bay State Wind), One International Place, 100 Oliver Street, Suite 1400, Boston, MA 02110, is hereby authorized under section 101(a)(5)(D) of the Marine Mammal Protection Act (MMPA; 16 U.S.C. 1371(a)(5)(D)) to harass marine mammals incidental to high-resolution geophysical (HRG) and geotechnical survey investigations associated with marine site characterization activities off the coast of Massachusetts in the area of the Commercial Lease of Submerged Lands for Renewable Energy Development on the Outer Continental Shelf, contingent upon the following conditions:

1. This Authorization is valid from August 13, 2016 through August 12, 2017.
2. This Authorization is valid only for HRG and geotechnical survey investigations associated with marine site characterization activities, as described in the Incidental Harassment Authorization (IHA) application.
3. General Conditions
 - (a) A copy of this IHA must be in the possession of Bay State Wind, its designees, and work crew personnel operating under the authority of this IHA.
 - (b) The species and numbers authorized for taking are:
 - (i) Minke whale (*Balaenoptera actuorostrata*) - 8
 - (ii) Fin whale (*Balaenoptera physalus*) - 3
 - (iii) Humpback whale (*Megaptera novaeangliae*) - 1
 - (iv) North Atlantic right whale (*Eubalaena glacialis*) - 1
 - (v) Short-beaked common dolphin (*Delphinus delphis*) - 163
 - (vi) Atlantic white-sided dolphin (*Lagenorhynchus acutus*) - 148
 - (vii) Harbor porpoise (*Phocoena phocoena*) - 4
 - (viii) Gray seal (*Halichoerus grypis*) - 259
 - (ix) Harbor seal (*Phoca vitulina*) - 178



- (c) The taking, by Level B harassment only, is limited to the species listed in condition 3(b).
- (d) The taking by injury (Level A harassment), serious injury, or mortality of any of the species listed in Condition 3(b) above or any taking of any other species of marine mammal is prohibited and may result in the modification, suspension, or revocation of this IHA.
- (e) The taking of any marine mammal in a manner prohibited under this IHA must be reported immediately to NMFS' Greater Atlantic Regional Fisheries Office (GARFO), 55 Great Republic Drive, Gloucester, MA 01930-2276; phone 978-281-9300, and NMFS' Office of Protected Resources, 1315 East-West Highway, Silver Spring, MD 20910; phone 301-427-8401.
- (f) The holder of this Authorization must notify the Chief of the Permits and Conservation Division, Office of Protected Resources, or her designee at least 24 hours prior to the start of survey activities (unless constrained by the date of issuance of this Authorization in which case notification shall be made as soon as possible) at 301-427-8401 or to *John.Fiorentino@noaa.gov*.

4. Mitigation Requirements

The holder of this Authorization is required to implement the following mitigation measures:

- (a) *Marine Mammal Exclusion Zones:* Protected species observers (PSOs) shall monitor the following zones for the presence of marine mammals:
 - A 400-m exclusion zone during HRG surveys when the sub-bottom profiler is in operation.
 - A 200-m exclusion zone during HRG surveys when all other equipment (*i.e.*, equipment positioning systems) is in operation.
 - A 3,500-m monitoring zone during the use of DP thrusters during geotechnical survey.
 - At all times, the vessel operator shall maintain a separation distance of 500 m from any sighted North Atlantic right whale as stipulated in 4(f) b.
- (b) *Monitoring of Marine Mammal Exclusion Zones:*
 - (i) Visual monitoring of the established exclusion zone(s) shall be performed by qualified and NMFS-approved PSOs.

- (ii) An observer team comprising a minimum of four NMFS-approved PSOs and two certified Passive Acoustic Monitoring (PAM) operators, operating in shifts, shall be stationed aboard either the survey vessel or a dedicated PSO-vessel.
 - (iii) PSOs shall be equipped with binoculars and have the ability to estimate distances to marine mammals located in proximity to the vessel and/or exclusion zone using range finders. Digital single-lens reflex camera equipment shall be used to record sightings and verify species identification.
 - (iv) During night operations, PAM (see *Passive Acoustic Monitoring* requirements in 4(h)) and night-vision equipment in combination with infrared video monitoring shall be used.
 - (v) The PSOs shall begin observation of the exclusion zone(s) at least 60 minutes prior to ramp-up of HRG survey equipment. Use of noise-producing equipment shall not begin until the exclusion zone is clear of all marine mammals for at least 60 minutes.
 - (vi) If a marine mammal is seen approaching or entering the 200-m or 400-m exclusion zones during the HRG survey, or the 3,500-m monitoring zone during DP thrusters use, the vessel operator shall adhere to the shutdown and powerdown procedures described in 4(d) and 4(e) to minimize noise impacts on the animal.
- (c) *Ramp-Up:*
- (i) A ramp-up procedure shall be used for HRG survey equipment capable of adjusting energy levels at the start or re-start of HRG survey activities.
 - (ii) The ramp-up procedure shall not be initiated during daytime, night time, or periods of inclement weather if the exclusion zone cannot be adequately monitored by the PSOs using the appropriate visual technology (*e.g.*, reticulated binoculars, night vision equipment) and/or PAM for a 60-minute period.
 - (iii) A ramp-up shall begin with the power of the smallest acoustic HRG equipment at its lowest practical power output appropriate for the survey. The power shall then be gradually turned up and other acoustic sources added such that the source level would increase in steps not exceeding 6 dB per 5-minute period.
 - (iv) If marine mammals are observed within the HRG survey exclusion zone prior to or during the ramp-up, activities shall be delayed until the

animal(s) has moved outside the monitoring zone and no marine mammals are sighted for a period of 60 minutes.

(d) *Shutdown:*

- (i) The exclusion zone(s) around the noise-producing HRG survey equipment shall be monitored by PSOs and at night by PAM operators for the presence of marine mammals before, during, and after any noise-producing activity.
- (ii) The vessel operator shall comply immediately with any call for shutdown by the Lead PSO.
- (iii) If a non-delphinoid (*i.e.*, mysticetes and sperm whales) cetacean is detected at or within the established exclusion zone (200-m exclusion zone during equipment positioning systems use; 400-m exclusion zone during the operation of the sub-bottom profiler), an immediate shutdown of the HRG survey equipment is required. Subsequent restart of the electromechanical survey equipment shall use the ramp-up procedures described in 4(c) and shall only occur following clearance of the exclusion zone for 60 minutes.
- (iv) If a delphinoid cetacean or pinniped is detected at or within the exclusion zone, the HRG survey equipment shall be powered down to the lowest power output that is technically feasible. Subsequent power up of the survey equipment shall use the ramp-up procedures described in 4(c) and shall occur after (1) the exclusion zone is clear of a delphinoid cetacean and/or pinniped for 60 minutes or (2) a determination by the PSO after a minimum of 10 minutes of observation that the delphinoid cetacean or pinniped is approaching the vessel or towed equipment at a speed and vector that indicates voluntary approach to bow-ride or chase towed equipment.
- (v) If the HRG sound source shuts down for reasons other than encroachment into the exclusion zone by a marine mammal including but not limited to a mechanical or electronic failure, resulting in the cessation of sound source for a period greater than 20 minutes, a restart for the HRG survey equipment is required using the full ramp-up procedures and clearance of the exclusion zone of all cetaceans and pinnipeds for 60 minutes. If the pause is less than 20 minutes, the equipment shall be restarted as soon as practicable at its operational level as long as visual surveys were continued diligently throughout the silent period and the exclusion zone remained clear of cetaceans and pinnipeds. If the visual surveys were not continued diligently during the pause of 20 minutes or less, a restart of the HRG survey equipment is required using the full ramp-up procedures and

clearance of the exclusion zone for all cetaceans and pinnipeds for 60 minutes.

(e) *Powerdown:*

- (i) During geotechnical survey activities if marine mammals enter or approach the established 3,500-m 120 dB isopleth monitoring zone, the Holder shall reduce DP thruster to the maximum extent possible, except under circumstances when reducing DP thruster use would compromise safety (both human health and environmental) and/or the integrity of the equipment.
- (ii) After decreasing thruster energy, PSOs shall continue to monitor marine mammal behavior and determine if the animal(s) is moving towards or away from the established monitoring zone.
- (iii) If the animal(s) continues to move towards the sound source then DP thruster use shall remain at the reduced level. Normal use shall resume when PSOs report that the marine mammals have moved away from and remained clear of the monitoring zone for a minimum of 60 minutes since the last sighting

(f) *Vessel Strike Avoidance:*

- (i) The Holder shall ensure that vessel operators and crew maintain a vigilant watch for cetaceans and pinnipeds and slow down or stop their vessels to avoid striking these protected species.
- (ii) Survey vessel crew members responsible for navigation duties shall receive site-specific training on marine mammal sighting/reporting and vessel strike avoidance measures.
- (iii) Vessel strike avoidance measures shall include the following, except under extraordinary circumstances when complying with these requirements would put the safety of the vessel or crew at risk:
 - All vessel operators shall comply with 10 knot (<18.5 kilometers per hour [km/h]) speed restrictions in any Dynamic Management Area (DMA). In addition, all vessels operating from November 1 through July 31 shall operate at speeds of 10 knots (<18.5 km/h) or less.
 - All survey vessels shall maintain a separation distance of 500 m or greater from any sighted North Atlantic right whale.
 - If underway, vessels shall steer a course away from any sighted North Atlantic right whale at 10 knots (<18.5 km/h) or less until the 500 m

minimum separation distance has been established. If a North Atlantic right whale is sighted in a vessel's path, or within 100 m to an underway vessel, the underway vessel shall reduce speed and shift the engine to neutral. Engines shall not be engaged until the North Atlantic right whale has moved outside of the vessel's path and beyond 100 m. If stationary, the vessel shall not engage engines until the North Atlantic right whale has moved beyond 100 m.

- All vessels shall maintain a separation distance of 100 m or greater from any sighted non-delphinoid (*i.e.*, mysticetes and sperm whales) cetacean. If sighted within 100 m, the vessel underway shall reduce speed and shift the engine to neutral, and shall not engage the engines until the non-delphinoid cetacean has moved outside of the vessel's path and beyond 100 m. If a survey vessel is stationary, the vessel shall not engage engines until the non-delphinoid cetacean has moved out of the vessel's path and beyond 100 m.
- All vessels shall maintain a separation distance of 50 m or greater from any sighted delphinoid cetacean. Any vessel underway shall remain parallel to a sighted delphinoid cetacean's course whenever possible, and avoid excessive speed or abrupt changes in direction. Any vessel underway shall reduce vessel speed to 10 knots or less when pods (including mother/calf pairs) or large assemblages of delphinoid cetaceans are observed. Vessels may not adjust course and speed until the delphinoid cetaceans have moved beyond 50 m and/or abeam of the underway vessel.
- All vessels shall maintain a separation distance of 50 m (164 ft) or greater from any sighted pinniped.

(g) *Seasonal Operating Requirements:*

- (i) Between watch shifts members of the monitoring team shall consult the NMFS North Atlantic right whale reporting systems for the presence of North Atlantic right whales throughout survey operations.
- (ii) Throughout all survey operations, the Holder shall monitor the NMFS North Atlantic right whale reporting systems for the establishment of a DMA. If NMFS should establish a DMA in the Lease Area under survey, within 24 hours of the establishment of the DMA the Holder shall work with NMFS to shut down and/or alter the survey activities to avoid the DMA.

(h) *Passive Acoustic Monitoring:*

- (i) The Holder shall include PAM as part of the project monitoring during the geophysical and geotechnical surveys during nighttime operations, or as needed during periods when visual observations may be impaired.
- (ii) PAM systems shall be employed during daylight hours to support system calibration and PSO and PAM team coordination, as well as in support of efforts to evaluate the effectiveness of the various mitigation techniques (*i.e.*, visual observations during day and night, compared to the PAM detections/operations).
- (iii) PAM operators shall communicate detections/vocalizations to the Lead PSO on duty who shall ensure the implementation of the appropriate mitigation measure.

5. Monitoring Requirements

The holder of this Authorization is required to conduct the following mitigation measures:

(a) *Visual Monitoring:*

- (i) PSOs shall visually monitor the established Level B harassment zones (400-m radius during sub-bottom profiler use and 200-m radius for equipment positioning system use during HRG surveys; 3,500-m radius during DP thruster use).
- (ii) PSOs shall be stationed on the highest available vantage point on the associated operating platform.
- (iii) PSOs shall estimate distance to marine mammals visually, using laser range finders or by using reticle binoculars during daylight hours.
- (iii) During night operations, PSOs shall use night-vision binoculars in combination with infrared video monitoring.
- (iv) Data on all PSO observations will be recorded based on standard PSO collection requirements and shall include the following:
 - Dates and locations of survey operations;
 - Vessel activity during sighting;
 - Time and location (*i.e.*, distance from sound source) of observation;
 - Weather conditions (*i.e.*, percent cloud cover, visibility, percent glare);

- Water conditions (*i.e.*, Beaufort sea-state, tidal state, swell);
- Details of the sightings (species, description of observed animal, sex, age classification [if known], numbers); and
- Reaction of the animal(s) to relevant sound source (if any) and observed animal behavior (*e.g.*, avoidance, approach), including bearing and direction of travel.

(b) *Acoustic Field Verification*

- (i) The Holder shall conduct field verification of the exclusion zone (the 160 dB isopleth) for HRG survey equipment and the powerdown zone (the 120 dB isopleth) for DP thruster use for all equipment operating below 200 kHz.
- (ii) The Holder shall take acoustic measurements at a minimum of two reference locations and in a manner that is sufficient to establish source level (peak at 1 meter) and distance to the 180 dB and 160 dB isopleths (the Level A and B harassment zones for HRG surveys) and 120 dB isopleth (the Level B harassment zone) for DP thruster use. Sound measurements must be taken at the reference locations at two depths (*i.e.*, a depth at mid-water and a depth at approximately 1 meter [3.28 ft] above the seafloor).
- (iii) The Holder shall use the results from its field-verification efforts to request modification of the exclusion/monitoring zones for the HRG or geotechnical surveys. Any new exclusion/monitoring zone radius proposed by the Holder shall be based on the most conservative measurements (*i.e.*, the largest safety zone configuration) of the target Level A or Level B harassment acoustic threshold zones. The modified zone shall be used for all subsequent use of field-verified equipment. The Holder shall obtain approval from NMFS and the Bureau of Ocean Energy Management (BOEM) of any new exclusion/monitoring zone before it may be implemented.

6. Reporting Requirements

The holder of this Authorization is required to provide the following notifications and reports:

- (a) The Holder shall contact NMFS and BOEM within 24 hours of the commencement of survey activities and again within 24 hours of the completion of the activity.

- (b) Within 90 days after completion of the marine site characterization survey activities, a draft technical report shall be provided to NMFS and BOEM that fully documents the methods and monitoring protocols, summarizes the data recorded during monitoring (as identified above in 5(a)), estimates the number of marine mammals that may have been taken during survey activities, and provides an interpretation of the results and effectiveness of all monitoring tasks. Any recommendations made by NMFS shall be addressed in the final report prior to acceptance by NMFS.
- (c) In addition to the reporting requirements outlined above, the Holder shall provide an assessment report of the effectiveness of the various mitigation techniques (*i.e.*, visual observations during day and night, compared to the PAM detections/operations). This shall be submitted as a draft to NMFS and BOEM 30 days after the completion of the HRG and geotechnical surveys and as a final version 60 days after completion of the surveys.
- (d) Reporting injured or dead marine mammals
- (i) In the unanticipated event that the specified activities clearly causes the take of a marine mammal in a manner prohibited by the IHA, such as a serious injury, or mortality, the Holder shall immediately cease the specified activities and report the incident to the Office of Protected Resources, NMFS (301-427-8401 and/or by email to *Jolie.Harrison@noaa.gov* and *John.Fiorentino@noaa.gov*), and the GARFO Stranding Coordinator, NMFS (978-282-8478 and/or by email to *Mendy.Garron@noaa.gov*). The report shall include the following information:
- Time and date of the incident;
 - Description of the incident;
 - Environmental conditions (*e.g.*, wind speed and direction, Beaufort sea state, cloud cover, and visibility);
 - Description of all marine mammal observations and active sound source use in the 24 hours preceding the incident;
 - Species identification or description of the animal(s) involved;
 - Fate of the animal(s); and
 - Photographs or video footage of the animal(s) (if equipment is available).

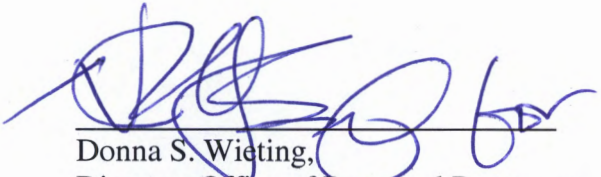
Activities shall not resume until NMFS is able to review the circumstances of the prohibited take. NMFS shall work with the Holder to determine what measures are necessary to minimize the likelihood of further

prohibited take and ensure MMPA compliance. The Holder shall not resume activities until notified by NMFS.

- (ii) In the event that the Holder discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (*e.g.*, in less than a moderate state of decomposition), the Holder shall immediately report the incident to Office of Protected Resources, NMFS, and the GARFO Stranding Coordinator, NMFS. The report shall include the same information identified in 6(d)(i) of this IHA. Activities may continue while NMFS reviews the circumstances of the incident. NMFS shall work with the Holder to determine whether additional mitigation measures or modifications to the activities are appropriate.
- (iii) In the event that the Holder discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (*e.g.*, previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Holder shall report the incident to the Office of Protected Resources, NMFS, and the GARFO Stranding Coordinator, NMFS, within 24 hours of the discovery. The Holder shall provide photographs or video footage (if available) or other documentation of the stranded animal sighting to NMFS.

7. This Authorization may be modified, suspended or withdrawn if the Holder fails to abide by the conditions prescribed herein, or if NMFS determines the authorized taking is having more than a negligible impact on the species or stock of affected marine mammals.

AUG 03 2016



Donna S. Wieting,
Director, Office of Protected Resources,
National Marine Fisheries Service.

Date